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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/853,044	05/11/2001	Sergey Doudnikov	CIT/K-146	5077
34610	7590	01/13/2005	EXAMINER	
FLESHNER & KIM, LLP			PATEL, SHEFALI D	
P.O. BOX 221200			ART UNIT	
CHANTILLY, VA 20153			PAPER NUMBER	

2621

DATE MAILED: 01/13/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/853,044

Applicant(s)

DOUDNIKOV ET AL.

Examiner

Shefali D Patel

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 31 August 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-16 and 18-23 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 August 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All - b) ☐ Some \* c) ☐ None of: \_\_\_\_\_
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 8/31/04.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Response to Amendment*

1. The amendment was filed on August 31 2004 along with the IDS and replacement drawings have been entered.
2. Corrections to the Figures 4 and 5 made so far have been accepted. However, Figure 5 is objected further, see the objection below for more information.
3. 35 U.S.C. 112 2<sup>nd</sup> paragraph rejections made to claims 3-8 have been withdrawn.

### *Drawings*

4. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: **reference number 47 in Figure 5 is not disclosed in the specification**. Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### *Claim Objections*

5. The numbering of claims is not in accordance with 37 CFR 1.126 which requires the original numbering of the claims to be preserved throughout the prosecution. When claims are canceled, the remaining claims must not be renumbered. When new claims are presented, they must be numbered

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consecutively beginning with the number next following the highest numbered claims previously presented (whether entered or not).

Please note, claim 17 is missing on page 9 of the amendment.

6. Claim 12 is objected to because of the following informalities: claim 12 recites "An system for..." Perhaps, this ought to be "A system for..." Appropriate correction is required.

*Response to Arguments*

7. Applicants' arguments filed on August 31, 2004 have been fully considered but they are not persuasive.

Applicants argue on page 13 and 14 of the remarks stating: the virtual image created by the head-mounted display of Kodama is not a three-dimensional image...and thus, Kodama is directed to a traditional two-dimensional head-mounted display.

The examiner disagrees. Please note, as stated in the office action mailed on June 8, 2004 that the observer sees the 2d images as a virtual image in 3D as disclosed at col. 9 lines 10-15 there the user is able to view the image "virtually" which is three-dimension. Kodama further discloses at col. 2 lines 56-60 stating a virtual image can be seen naturally by both eyes of a user (i.e., stereoscopic view, 3D). Even, further, regarding these independent claims, since preamble and the body of the claims 1 and 9 do not refer to the same feature, feature in the preamble has given no patentable weight. However, for clarification, the rejection is made in view of Ishikawa et al. (US 6,549,650) and the arguments are moot.

However, applicant argues on page 15 of the remarks stating: Kodama fails to teach or suggest these features, because Kodama does not synthesize a three-dimensional image from multiple two-dimensional images. The examiner agrees. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Ishikawa et al. (US 6,549,650).

*Claim Rejections - 35 USC § 103*

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 1-16 and 18-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kodama (US 5,917,460) in view of Ishikawa et al. (hereinafter, "Ishikawa") (US 6,549,650).

With regard to **claim 1** Kodama discloses an apparatus for displaying a three-dimensional image, which synthesizes *multiple* two-dimensional microimages *of a scene* (the two 2D images are at 18 and 19 in Figure 2, col. 9 lines 57-64) and regenerates them in a three-dimensional image *of a scene* (the observer sees these two 2D images as a virtual image in 3D), the apparatus comprising: a detector (detector 20 in Fig. 2) for tracing movement of an observer head that observes the three-dimensional image, in real time and detecting a position of the observer head (tracing the movement and detecting the position on whether the observer's head is moving upwardly or downwardly with the detector 20 at col. 10 lines 1-10, 35-38); and a compensator for adjusting a viewing zone of the three-dimensional image (adjusting the view according the movement of the observer's head at col. 10 lines 55-66) and/or compensating distortion of the three-dimensional image *by manipulating the microimages* in accordance with a signal input from the detector (See, col. 10 lines 11-18). Note, Kodama in the background information discloses prior art knowledge that converts two images signal in accordance with a three-dimensional movement of the head at col. 1 line 46 to col. 2 lines 1-10. Kodama discloses this at col. 9 lines 10-15 where the user is able to view the image "virtually" which is three-dimensional.

Kodama does not expressly disclose synthesizing multiple images to generate a three-dimensional image. Ishikawa discloses synthesizing multiple images to obtain a three-dimensional image of the object

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or a scene at col. 23 lines 15-23, line 65 to col. 24 lines 1-6 and col. 25 lines 27-37. Kodama and Ishikawa are combinable because they are from the same field of endeavor, i.e., processing images obtained by a camera. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine the teaching of Ishikawa with Kodama. The motivation for doing so is to display the three-dimensional image to the operator thus allowing the operator to adjust stereoscopic expression of a image during image sensing as suggested by Ishikawa at col. 5 lines 14-19. Therefore, it would have been obvious to combine Ishikawa with Kodama to obtain the invention as specified in claim 1.

With regard to **claim 2** Kodama discloses the detector (detector device 20 in figure 2) comprising a head tracking system (this detector traces the head movement at col. 10 lines 1-10), which traces movement of the observer head in real time, and a head position detector for calculating the position of the observer head traced by the head tracking system (See, col. 10 lines 55-66).

With regard to **claim 3** Kodama discloses the compensator comprising either a viewing adjust engine which adjusts the viewing zone of the three-dimensional image by moving the microimages in accordance with a signal input from the head position detector (adjusting the view zone as seen in Figure 4, for example, from 25 to 26, at col. 10 lines 55-66), or a device which regenerates the *multiple* microimages of the scene in accordance with the signal input from the head position detector to compensate distortion of the three-dimensional image (a device seen in Figure 2 regenerating the images using the image signal converter 21).

With regard to **claim 4** Kodama discloses an apparatus for displaying a three-dimensional image, comprising: a plurality of two-dimensional microimages of a scene (Figure 2 containing two-dimensional microimages 18 and 19); a head tracking system for tracing movement of an observer head that observes the three-dimensional image, in real time (tracking system 20 in Figure 3); a head position detector for calculating the position of the observer head traced by the head tracking system (See, col. 10 lines 1-10);

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and a viewing adjust engine for adjusting a viewing zone of the three-dimensional image by moving the microimages in accordance with a signal input from the head position detector (see, col. 10 lines 55-66).

Kodama discloses microlens arrays 16 and 17 representing an image in three-dimension to an observer by using the image signal converter 21. However, Kodama does not expressly disclose a microlens array for synthesizing the two-dimensional microimages and regenerating them in a three-dimensional image. Ishikawa discloses synthesizing multiple images to obtain a three-dimensional image of the object or a scene at col. 23 lines 15-23, line 65 to col. 24 lines 1-6 and col. 25 lines 27-37. Also see, synthesizer 114 in Figures and its respective portions in the specification. Kodama and Ishikawa are combinable because they are from the same field of endeavor, i.e., processing images obtained by a camera. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine the teaching of Ishikawa with Kodama. The motivation for doing so is to display the three-dimensional image to the operator thus allowing the operator to adjust stereoscopic expression of a image during image sensing as suggested by Ishikawa at col. 5 lines 14-19. Therefore, it would have been obvious to combine Ishikawa with Kodama to obtain the invention as specified in claim 1.

With regard to claim 5 Kodama discloses a device, which regenerates the microimages of the scene in accordance with the signal input from the head position detector to compensate distortion of the three-dimensional image (a device as seen in Figure 2 regenerating the images using the image signal converter 21).

With regard to claim 6 Kodama discloses the apparatus of claim 5, wherein the regenerated microimages are *movable by the viewing adjust engine* to form a new viewing zone centered relative to the moved observer head (See, col. 11 lines 34-55).

With regard to claim 7, Kodama discloses all of the claimed subject matter as already discussed above in claims 1 and 4 and the arguments are not repeated herein, but are incorporated by reference. Claim 7 distinguishes from claim 4 only in that it recites an a device for regenerating the microimages in

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accordance with a signal input from the head position detector to compensate distortion of the three-dimensional image. Kodama discloses a device as seen in Figure 2 regenerating the images using the image signal converter 21.

**Claim 8** recites identical features as claim 6. Thus, arguments similar to that presented above for claim 6 is equally applicable to claim 8.

**Claim 9** recites identical features as claim 1 except claim 9 is a method claim. Thus, arguments similar to that presented above for claim 1 is equally applicable to claim 9.

**Claim 10** recites identical features as claim 6 except claim 10 is a method claim. Thus, arguments similar to that presented above for claim 6 is equally applicable to claim 10.

With regard to **claim 11** Kodama discloses compensating distortion of the three-dimensional image as discussed above comprising regenerating the two-dimensional microimages of the scene (every time the observer moves his/her head as seen in Figure 5 the two dimensional images 18 and 19 are being regenerated, having a respective center, before image signal converter displays to the observer in three-dimension).

With regard to **claim 12** Kodama in view of Ishikawa discloses a system for displaying a three-dimensional image of a scene that is generated via multiple two-dimensional images of the scene as disclosed above in claims 1, 4, 7, and 9 and the arguments are not repeated herein, but are incorporated by reference.

**Claim 13** recites identical features as claim 2. Thus, arguments similar to that presented above for claim 2 is equally applicable to claim 13.

With regard to **claim 14** Kodama discloses a viewing adjust engine that adjusts the viewing zone of the three-dimensional image by moving the two-dimensional images of the scene based on the position signal (adjusting the view zone as seen in Figure 4, for example, from 25 to 26, at col. 10 lines 55-66),



With regard to **claim 15** Kodama discloses a device that compensates for distortion by regenerating the two-dimensional images of the scene based on the position signal (a device as seen in Figure 2 regenerating the images using the image signal converter 21, See, col. 10 lines 11-18).

**Claim 16** recites identical features as claims 14-15. Thus, arguments similar to that presented above for claims 14-15 are equally applicable to claim 16.

With regard to **claim 18** Kodama discloses the detector detecting the position of the observer by tracking the observer's head (tracing the movement and detecting the position on whether the observer's head is moving upwardly or downwardly with the detector 20 at col. 10 lines 1-10, 35-38).

With regard to **claim 19** Kodama discloses a method of manipulating a three-dimensional image of a scene that is generated via multiple two-dimensional images of the scene (col. 9 lines 57-67), comprising: determining a position of an observer of the three-dimensional image (col. 10 lines 1-18); and manipulating the two-dimensional images of the scene based on the determined position of the observer (see, col. 10 lines 55-66, col. 12 lines 41-52).

**Claim 20** recites identical features as claim 18. Thus, arguments similar to that presented above for claim 18 is equally applicable to claim 20.

**Claim 21** recites identical features as claim 14. Thus, arguments similar to that presented above for claim 14 is equally applicable to claim 21.

**Claim 22** recites identical features as claim 15. Thus, arguments similar to that presented above for claim 15 is equally applicable to claim 22.

**Claim 23** recites identical features as claims 21-22. Thus, arguments similar to that presented above for claims 21-22 are equally applicable to claim 23.

### ***Conclusion***

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.  
US 6,501,468 – stereoscopic display system displaying images for right and left eyes

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US 5,936,774 – display of autostereoscopic images

US 5,388,990 – virtual reality control system displaying to the pilot the images of a scene

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shefali D Patel whose telephone number is 703-306-4182. The examiner can normally be reached on M-F 8:00am - 5:00pm (First Friday Off).

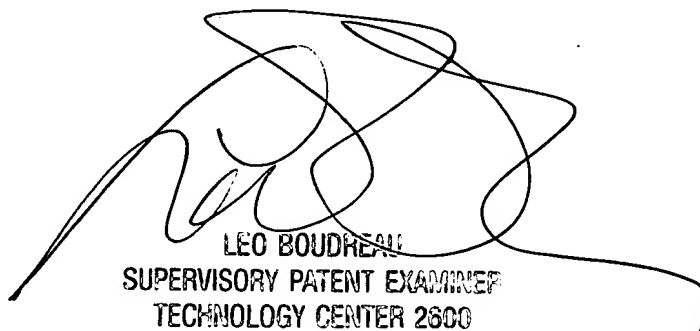
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Leo H Boudreau can be reached on 703-305-4706. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Shefali D Patel  
Examiner  
Art Unit 2621

December 30, 2004



LEO BOUDREAU  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2600